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BUDGETARY PRIORITIES IN LATIN AMERICA: MILITARY, HEALTH AND EDUCATION SPENDING

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SUMMARY

● Military expenditure in Latin American countries has been increasing rapidly in recent years, leading to concerns that this may be diverting resources from much-needed social spending. An analysis of rates of government military, education and health spending between 1995 and 2009 shows that health and education spending has been significantly higher than military spending in nearly all the 21 countries for which adequate data is available. Moreover, the trend in most countries has been for health expenditure to rise, and military expenditure to fall, as shares of GDP. The study finds no statistical evidence that military spending has 'crowded out' either of the other two areas of spending. Rather, a small positive relationship seems to exist between health and military spending, although this should not be seen as a causal relationship. A study of national policy processes would be needed in order to provide a deeper understanding of the question of a trade-off between military and social spending, and of how spending levels are matched to national needs and priorities.

I. Introduction

In common with most other regions of the world, military expenditure in Latin America has been increasing rapidly in recent years.[1] Since 2003 it has risen at an average rate of 8.5 per cent per year, reaching $69.7 billion in 2010, according to SIPRI data.[2] Internal armed conflicts in Colombia, Mexico and, to a lesser, extent Peru are a significant security concern not only for those countries but also, sometimes, for their neighbours. In addition, many parts of Central America are experiencing high levels of organized criminal violence. Nevertheless, the threat of interstate conflict in the region has been virtually non-existent for some time. In addition, many Latin American countries are plagued by high levels of poverty and inequality.[3] The rising trend in military expenditure in the region has raised concern in some quarters that scarce resources are being unnecessarily diverted from other, civilian, budgetary priorities, especially areas such as health and education that are key to furthering economic and human development.

[1] This report covers Caribbean, Central American and South American countries included in the SIPRI Military Expenditure Database (which excludes many small island states), and for which adequate data is available. These are Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. For more on the SIPRI Military Expenditure Database see <http://www.sipri.org/databases/milex/>.

[2] SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex>. The regional total includes figures or estimates for the countries listed in note 1 with the exceptions of Costa Rica, which has no military expenditure, and Cuba, for which currency conversion issues make meaningful dollar estimates problematic.

[3] By the most commonly used measure of income inequality, the Gini coefficient, Latin American countries accounted for 16 of the 20 most unequal countries in 1997–2006 for which data was available in the United Nations University–World Institute for Development Economics Research (UNU-WIDER) database, <http://www.wider.unu.edu/research/Database/en_GB/wiid/>. Of the countries in the study, 15 had higher levels of inequality than the United States—the most unequal country in the Organisation for Economic Co-operation and Development (OECD)—in 2004 (or the most recent year for which data was available).

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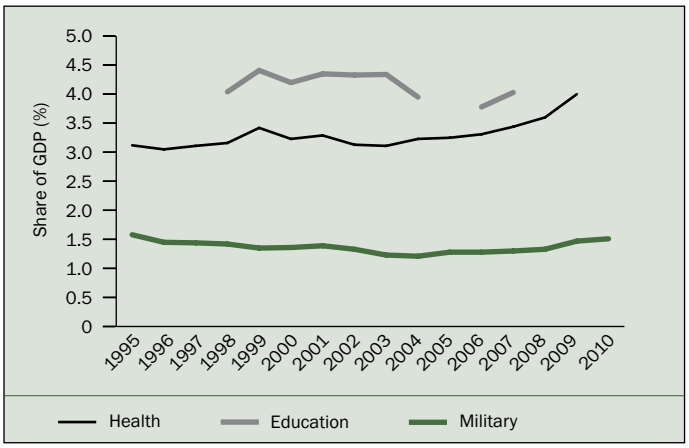


Figure 1. Military, health and education spending as shares of gross domestic product in Latin America, 1995–2010

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; and World Bank World Development Indicators online, <http://data.worldbank.org>.

In order to examine whether statistical evidence supports the idea that military spending increases have come at the expense of social spending, this study analyses trends in military, health and education expenditure in the region during the period 1995–2009, and explores what relationship, if any, exists between these trends.

Section II gives a descriptive analysis of the data for military, health and education expenditure in Latin America between 1995 and 2009, looking at broad trends within and across countries. Section III uses various graphical and statistical methods to assess what relationship, if any, exists between trends in the three areas of expenditure. Data for all areas of spending are analysed as a share of gross domestic product (GDP), to enable a meaningful comparison of relative priorities between countries and over time. Section IV considers in more detail the cases of Chile and Ecuador, the only two countries in the region where military spending has taken a higher share of GDP than health spending in recent years. Section V offers conclusions.

The military expenditure data used in this study is drawn from the SIPRI Military Expenditure Database, which includes consistent time series on the military spending of 171 countries since 1988. The SIPRI definition of military expenditure covers all financial resources for current military forces and activities, including the armed forces, defence ministries, paramilitary forces—when they are judged to be trained and equipped for military operations—and military space activities. It includes all current and capital expenditure on military and civilian personnel, including pensions, operations and maintenance, procurement, research and development, and military aid given. While international comparisons of military expenditure data can be problematic due to differences in definition and coverage, SIPRI figures for those Latin American countries covered in the database correspond fairly closely to the standard SIPRI definition. The most significant exceptions in the region concern El Salvador, Paraguay and Uruguay, where the SIPRI figures do not include military pensions, and Peru and Venezuela, where the figures exclude some off-budget expenditures on arms imports.[4]

Data for education and health expenditure is taken from, respectively, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO).[5] Only government expenditure is considered as the aim of this study is to analyse government budget priorities. The data covers general government expenditure in these areas rather than spending by national education and health ministries in order to include central, regional and local government spending.

4 See Bromley, M. and Solmirano, C., *Transparency in Military Spending and Arms Acquisitions in Latin America*, SIPRI Policy Paper no. 31 (SIPRI: Stockholm, forthcoming).

5 Both sets of data were accessed through the World Bank World Development Indicators online database, <http://data.worldbank.org/>. Government health expenditure is calculated by multiplying the WHO figures for total health expenditure as a share of GDP by the WHO figures for the public sector (general government) share of total health expenditure.

This study is based solely on an analysis of data for military, health and education spending. Hence, it cannot provide a definitive answer to the question of whether rising military expenditure in Latin American countries comes at the expense of social expenditure. For that, it would be necessary also to examine the policy processes behind spending decisions.

II. Trends in military, health and education spending in Latin America

Overall regional trends in spending

Figure 1 shows the estimated shares of regional GDP devoted to military, health and education spending for all years since 1995 for which reliable data is available.[6] In the region as a whole, governments have spent far more on both health and education than on the military. Also, education expenditure has tended to be somewhat higher than health expenditure, although the gap appears to have closed since 2003.

Health expenditure as a share of GDP followed a clear rising trend between 2003 and 2010, before which it fluctuated. There is no consistent pattern for education spending in the period, and the share of GDP devoted to education remained essentially unchanged between the start and end years of 1998 and 2007. Military expenditure as a share of GDP—the 'military burden'—fell gradually in 1995–2003 and then rose gradually from 1.23 per cent of GDP in 2003 to 1.51 per cent in 2010, just below its 1995 level. The fact that the periods of rising military and health spending, in GDP terms, after 2003 coincided indicates that the one was not at the expense of the other; in contrast, education spending appears to have fallen after 2003 to its lowest levels since 1998, at least judging by the years for which data is available.

In the region as a whole, governments have spent far more on both health and education than on the military.

The overall regional patterns conceal wide national variations and tend to be dominated by a few very large economies, especially that of Brazil. The gradual rise in the regional military burden after 2003, for example, is not the result of most countries increasing their own military burdens. Rather, it is largely down to the fact that Brazil's economy grew much faster than Mexico's, so Brazil's higher share of military expenditure in GDP—rising from 1.5 to 1.6 per cent between 2003 and 2010—carries much greater weight in the average than Mexico's very low share—0.6 per cent in 2003 and 0.5 per cent in 2010. While the individual values for Brazil and Mexico barely changed, the regional average moved closer to the Brazilian figure.

In relation to military expenditure, a subregional breakdown can be illuminating. First, the military burden is far higher in South America, standing at 1.83 per cent in 2009, compared to 0.55 per cent in Central America and the

[6] For the countries covered by the SIPRI military expenditure totals and averages for the region see note 2. The health and education averages cover all developing countries in Latin America and the Caribbean: the countries included in the military expenditure totals plus Antigua and Barbuda, Costa Rica, Cuba, Dominica, Grenada, Guyana, Haiti, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Suriname. Regional averages are total regional military, health or education expenditure divided by total regional GDP. All regional averages are estimates.

Table 1. Military, health and education spending as average shares of gross domestic product in 21 Latin American countries, 1995–2009

Figures are percentages. Averages taken over years for which data is available.

	Average shares of gross domestic product spent on the military/health/education			
Country	1995–98	1999–2002	2003–2006	2007–2009
Argentina	1.2 / 4.7 / . .	1.2 / 4.9 / 4.5	1.0 / 4.5 / 3.9	0.9 / 5.5 / 4.9
Belize	1.3 / 2.4 / . .	0.9 / 2.2 / 5.5	1.0 / 2.1 / 5.3	1.2 / 3.3 / 5.4
Bolivia	[2.2] / 3.0 / . .	[2.2] / 3.8 / 5.8	2.0 / 3.6 / 6.3	1.9 / 3.0 / . .
Brazil	1.7 / 2.9 / . .	1.9 / 3.1 / 3.9	1.5 / 3.3 / 4.5	1.5 / 3.8 / 5.1
Chile	[3.2] / 2.8 / . .	3.7 / 3.5 / 4.0	3.6 / 2.8 / 3.6	3.5 / 3.4 / 3.7
Colombia	[3.0] / 5.7 / . .	[3.3] / 5.9 / 4.1	3.6 / 5.4 / 4.2	3.5 / 5.2 / 4.3
Costa Rica	0.0 / 4.9 / . .	0.0 / 5.2 / 4.8	0.0 / 5.5 / 4.9	0.0 / 6.3 / 5.4
Cuba[a]	. . / 5.4 / . .	. . / 5.9 / 7.9	3.6 / 6.7 / 9.4	3.5 / 10.8 / 12.8
Dominican Republic	0.9 / 1.4 / . .	1.3 / 2.0 / 2.0	0.8 / 1.8 / 1.9	0.7 / 2.2 / 2.3
Ecuador[b]	2.2 / 2.2 / . .	1.8 / 1.7 / 1.4	2.4 / 2.1 / . .	3.0 / 2.5 / . .
El Salvador[c]	0.9 / 3.1 / . .	0.8 / 3.6 / 2.6	0.7 / 3.7 / 2.8	0.6 / 3.7 / 3.3
Guatemala	0.8 / 1.5 / . .	0.8 / 2.2 / . .	0.5 / 2.2 / 3.0	0.4 / 2.4 / 3.1
Honduras	. . / 2.9 / . .	0.8 / 3.2 / . .	0.8 / 3.8 / . .	1.3 / 3.6 / . .
Jamaica	0.6 / 2.8 / . .	0.5 / 2.6 / 5.3	0.6 / 2.3 / 4.3	0.8 / 2.6 / 5.8
Mexico	0.6 / 2.1 / . .	0.6 / 2.4 / 4.9	0.4 / 2.6 / 5.0	0.5 / 2.8 / 4.8
Nicaragua	0.9 / 4.3 / . .	0.8 / 3.6 / 3.6	0.8 / 4.5 / 3.1	0.7 / 5.2 / . .
Panama	1.1 / 4.9 / . .	0.3 / 5.1 / 4.7	0.0 / 5.2 / 4.1	0 / 5.1 / 3.8
Paraguay[c]	[1.3] / 2.8 / . .	1.1 / 3.3 / 5.1	0.8 / 2.6 / 4.3	0.8 / 2.7 / 4.0
Peru[b d]	1.7 / 2.4 / . .	1.7 / 2.8 / 3.1	1.4 / 2.6 / 2.7	1.2 / 2.6 / 2.6
Uruguay	[1.8] / 5.0 / . .	[1.7] / 6.1 / 2.5	1.4 / 4.4 / 2.5	1.4 / 4.6 / . .
Venezuela[b]	1.5 / 1.5 / . .	1.4 / 2.3 / . .	1.4 / 2.3 / 3.7	1.3 / 2.5 / 3.7

[ ] = Some or all figures for this period are SIPRI estimates.

[a] The figures for Cuba's military expenditure as a share of gross domestic product are calculated using World Bank figures for GDP in current US dollars. The figures have not been included in SIPRI data published elsewhere.

[b] The figures for these countries exclude some off-budget spending from funds from oil or gas revenues.

[c] The military spending figures for these countries exclude military pensions.

[d] Military expenditure figures for Peru up to 1999 are believed to come from various stages of the budget process and are thus considered uncertain.

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; and World Bank World Development Indicators online, <http://data.worldbank.org>.

Caribbean in the same year.[7] (The figures excluding Brazil and Mexico are 2.1 per cent and 0.51 per cent, respectively.) Second, while in South America the armed forces fulfil primarily external security roles or, in the case of Colombia and Peru, combat armed insurgencies, those in Central America and the Caribbean are actively engaged in internal security activities—combating organized crime and drug smuggling—that elsewhere would be the function of civilian security forces or perhaps gendarmerie-type forces. Thus, the nature of the debate on budgetary priorities differs between these subregions.[8]

[7] Countries included in the subregional military expenditure totals are Central America and the Caribbean: Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua and Panama; and South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela.

[8] See e.g. Sparrow, T. 'Los ejércitos de Centroamérica vuelven a salir de compras' [The Central American armies are shopping again], BBC Mundo, 5 Oct. 2011, <http://www.bbc.co.uk/mundo/

Trends in spending by country

Table 1 shows the average shares of military, health and education expenditure in GDP over successive three- to four-year periods for the 21 countries included in the study. There was a wide diversity in levels of spending in all three categories. For military expenditure, there were three consistent upper outliers with military burdens well above 3 per cent: Chile, Colombia and Cuba, although in recent years Ecuador joined this group. At the other end of the scale, most countries in Central America and the Caribbean, except Honduras, had military burdens consistently below 1 per cent; in South America, the military burden fell to similar levels in Paraguay from 2003–2006 on and in Argentina in 2007–2009.[9] Between these two groups, most countries had military burdens between 1 and 2 per cent.

The clear leader in health expenditure was Cuba, which spent between 5.3 and 9.9 per cent of GDP on health in 1995–2009. Among the other countries, there was a wide and fairly even spread between Costa Rica at the top (4.9–6.0 per cent of GDP) and the Dominican Republic, which was usually at the bottom (1.3–2.1 per cent of GDP). There were no clear subgroupings or regional patterns, although the Andean nations—with the exception of Colombia—had relatively low levels of health expenditure. Three of the highest health spenders were Costa Rica and Panama, which have no armed forces, and Argentina, which was in the low military burden group. Colombia had high military and health spending, while Jamaica and Mexico were among countries spending relatively low shares of GDP on both health and the military.

The regional trends over time show a clear pattern: a tendency for rising health expenditure as a share of GDP to coincide with a falling military burden.

In education spending, although the data is patchier, Cuba was once again the clear leader and there was another fairly even spread below this, with no clear break between high and low spenders, or consistent regional patterns.

The trends over time do show one clear pattern: a tendency for rising health expenditure as a share of GDP to coincide with a falling military burden, in many cases in the same countries. Comparing the averages for 1995–98 with those for 2007–2009, the health share increased by at least 5 per cent in 15 of the 21 countries studied, and fell by at least 5 per cent in only 3 countries, while the military burden rose in 5 countries and fell in 14 (insufficient data is available to assess trends in Cuba). For education, comparing the period 1999–2002 with 2007–2009, of the 13 countries for which data is available for all three periods, the share of GDP rose by 5 per cent or more in 7 countries, and fell in 4, thus showing something of an increasing trend, but more ambiguous than that for health.

While the regional average level of health expenditure as a share of GDP did not really begin to increase until around 2003, a clear majority of countries saw increases in the average health share of GDP both between 1995–98 and 1999–2002 and between 2003–2006 and 2007–2009, while between 1999–2002 and 2003–2006 there were almost as many fallers as

noticias/2011/10/111003_america_central_armamento_tsb.shtml>.

[9] Figures for Paraguay and El Salvador are distorted by the omission of military pensions from the SIPRI figures. This omission is due to the fact that consistent data including pensions is not available for a sufficient period for these 2 countries. If pensions were included for 2009, the military burden in El Salvador and Paraguay would increase from 0.7% and 0.9% to 1.1% and 1.3%, respectively.

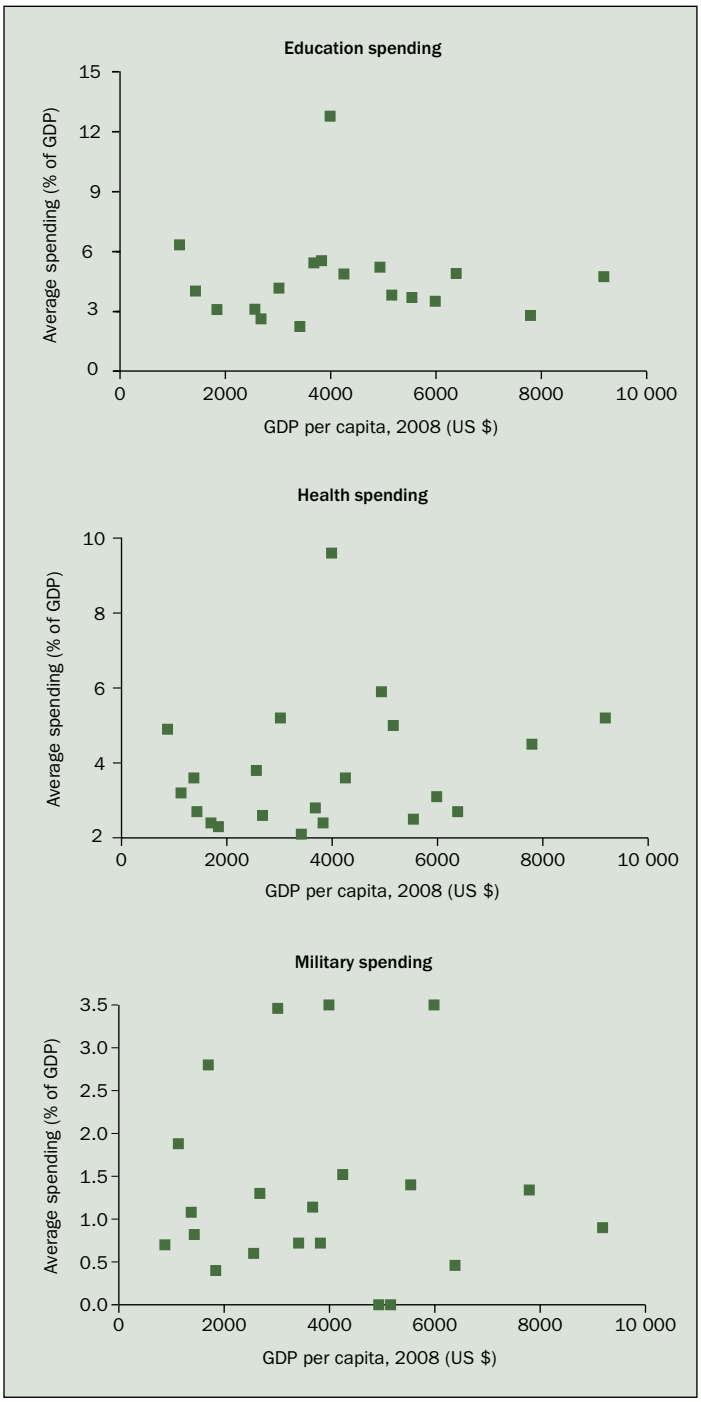


Figure 2. Average military, health and education spending as shares of gross domestic product (GDP) in 21 Latin American countries , 2005–2009, compared with per capita GDP, 2008

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; and World Bank World Development Indicators online, <http://data.worldbank.org>.

risers. For military expenditure, all periods saw a clear preponderance of fallers over risers. However, looking on a year-by-year basis, rather than at period averages, the falling trend in military expenditure as a share of GDP levelled out, with increases since 2003 in as many countries as decreases (see figure 4).

Both health and education spending have been consistently higher than military expenditure in almost all the countries studied, usually by a considerable margin. Two key exceptions, which are looked at in more detail in section IV, are Chile and Ecuador. In all years but 2009, Chile consistently spent slightly more on the military than on health, and roughly similar levels on education and the military (see figure 4). Ecuador initially spent similar levels on health and the military, but its military expenditure has moved ahead in recent years. (Education spending in Ecuador is very low for the few years for which data is available.) Of the other high military spenders, Colombia has managed to maintain relatively high levels of both health and education spending as a share of GDP, while Cuba's state-controlled economy and strong emphasis on social welfare shows through in very high spending in both areas.

The relationship between military expenditure and education and health spending is considered in section III. Another illuminating comparison can be made between each of the three categories of spending and GDP per capita. A previous SIPRI study found that high-income countries tended to devote a larger share of GDP to health and education spending than middle-income countries; and middle-income countries devoted a larger share of GDP to these areas than low-income countries. However, low-income countries had the highest average military burdens, while middle-income countries had the lowest.[10]

All of the Latin American countries studied here qualify as middle income, although they are divided between lower-middle- and upper-middle-income bands.[11] Nonetheless, the range of GDP per capita is quite substantial, from $984 in Nicaragua to $9186 in Argentina in 2008, with a full spread between them.

[10] Stålenheim, P., Perdomo, C. and Sköns, E., 'Military expenditure', *SIPRI Yearbook 2007: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2007), pp 271–75.

[11] As classified by the 2010 World Development Indicators. Lower-middle-income countries are those with gross national income per capita of $976–$3855 in 2008 and upper-middle-income countries are those with $3856–$11 905 in 2008. Belize, Bolivia, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua and Paraguay were in the lower group in 2008 and the other countries in the upper group.

Somewhat surprisingly, these appears to be no relationship between any of the categories of spending and GDP per capita (see figure 2). Thus, it does not appear at first sight to be the case that low national per capita income or lack of a tax base is a key constraining factor on any of the three areas of government spending considered here. Poor countries naturally tend to spend less on all budget areas than rich countries, but not a smaller share of their resources.

III. Statistical evidence of a trade-off between military and social spending?

A number of previous empirical studies have attempted to assess the evidence for direct budgetary trade-offs between military and social spending by using statistical (econometric) analysis to investigate whether higher or lower levels of military expenditure tend to be associated with higher or lower levels of social spending.[12] These include cross-country studies, individual country studies, and studies looking both across countries and over time.

The evidence from these earlier econometric studies is mixed. Some found negative relationships between defence and social spending and a similar number failed to find them, or even found positive relationships. Among those studies comparing data across countries worldwide, there is no direct evidence of trade-offs between military and social spending, although one study found an indirect effect through a tendency for military spending to reduce economic growth and thus lead to lower social spending. Overall, the strongest evidence for the existence of trade-offs seems to come from Latin America, where three out of four studies surveyed find that military expenditure has had some crowding-out effect on health and education.[13] It should be noted, however, that these studies cover periods when many countries in the region were under military dictatorships. A key question, therefore, is whether this relationship—if it has ever existed—still holds in the period covered by the present study, when Latin American countries have been predominantly democratic or democratizing, albeit with financial oversight of the military sector still somewhat weak.

[12] A detailed review of this literature can be found in Perlo-Freeman, S. and Perdomo, C., 'The developmental impact of military budgeting and procurement: implications for an arms trade treaty', Report prepared for Oxfam, 15 Apr. 2008, <http://www.sipri.org/research/armaments/milex/publications/unpubl_milex>.

[13] Apostolakis, B. E., 'Warfare–welfare expenditure substitutions in Latin America, 1953–87', *Journal of Peace Research*, vol. 29, no. 1 (Feb. 1992); Looney, R. E., 'Military expenditures in Latin America: patterns of budgetary tradeoffs', *Journal of Economic Development*, vol. 11, no. 1 (June 1986); and Scheetz, T., 'The evolution of public sector expenditures: changing political priorities in Argentina, Chile, Paraguay and Peru, *Journal of Peace Research*, vol. 29, no. 2 (May 1992). Verner found a mixed pattern of results in different Latin American countries. Verner, J. G., 'Budgetary trade-offs between education and defense in Latin America: a research note', *Journal of Developing Areas*, vol. 18, no. 1 (Oct. 1983).

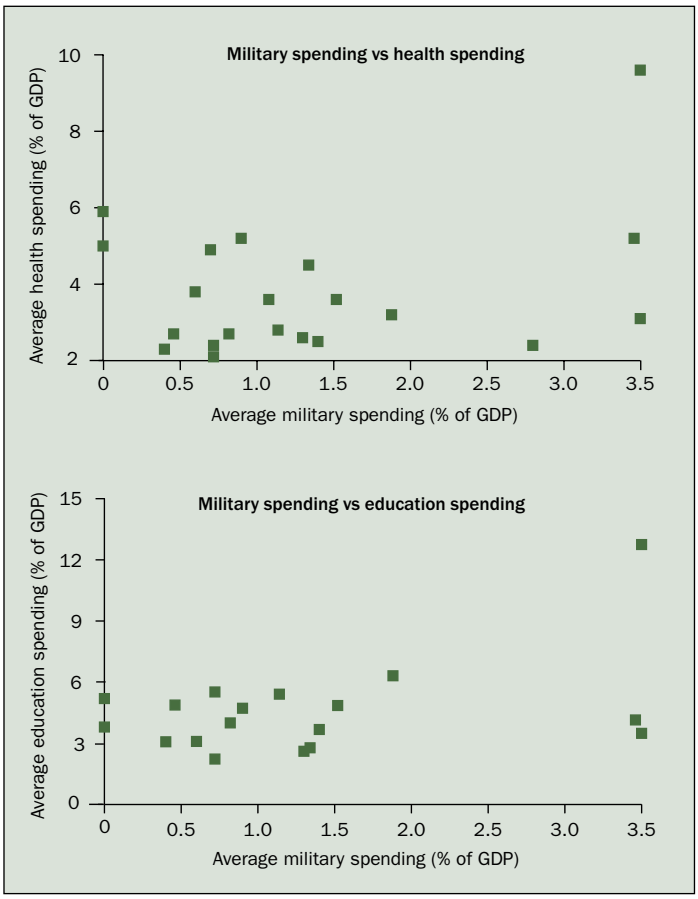


Figure 3. Comparisons of military spending with health and education spending as shares of gross domestic product in 21 Latin American countries, averages for 2005–2009

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; and World Bank World Development Indicators online, <http://data.worldbank.org>.

Evidence for budgetary trade-offs in military, health and education spending, 1995–2009

Examples can be found among the countries studied here of all combinations of high and low military burdens with different levels of health and education expenditure; for example, Cuba has high military, health and education spending; Costa Rica has zero military and high health and education spending; Guatemala has low military, health and education spending; Ecuador has high military and low health spending; and Jamaica has low military, high education and low health spending.

A fuller picture can be obtained by taking scatter plots of health and education spending as a share of GDP (averaged for the period 2005–2009) against military burdens over the same period, as shown in figure 3. Still, no obvious pattern emerges that would suggest that high levels of military spending have been particularly associated with either high or low levels of social spending in recent years. Indeed, if anything, there is a slight positive correlation between military spending as a share of GDP and the respective shares of both health and education, although this effect disappears if Cuba is excluded from the sample.

A second approach is to look at how the different areas of spending have changed in relation to each other over a longer period of time. For this, attention is restricted to the relationship between military and health expenditure, due to the sparsity of data for education. Two countries are excluded: Costa Rica, as its military spending has been zero for the entire period, and Cuba, as military spending data is available for only six years, insufficient for assessing changes over time.

Comparing the period averages given in table 1 for 1995–1998 and 2007–2009, while falling military burdens in most countries coincided with rising health expenditure as a share of GDP, there is no sign that the rates at which countries cut their military burdens bear any relation to the rates at which they increased the GDP share of health spending; there is, essentially, no statistical relationship between the changes in the two variables between the two periods.[14]

This finding can be tested further by comparing the changes in the two areas of spending from one period to the next (i.e. from 1995–98 to 1999–2002, from 1999–2002 to 2003–2006, and from 2003–2006 to 2007–2009). A small positive relationship emerges; that is, there is some evidence that those countries that increased their military burden—or reduced it by less than the average—also tended to increase their health spending as a share of

[14] For this analysis, Honduras must also be excluded. The correlation coefficient is –0.04.

GDP by more than the average. However, the relationship is weak and barely statistically significant.[15]

A further simple test is to consider the year-on-year changes in the military and health shares of GDP and to analyse how often they went up or down together. Of the 19 countries considered between 1995 and 2009 (2000–2009 in the case of Honduras), the military burden went down for 94 country-years, stayed level (to one decimal place) for 83 country-years and went up for 84 country-years. When the military burden went down, the health share of GDP also went down 52 per cent of the time and up 48 per cent of the time. When the military burden was level, the health share fell 43 per cent of the time and increased 57 per cent of the time. When the military burden went up, the health share fell 30 per cent of the time and increased 70 per cent of the time. Thus, the health share appears considerably more likely to go up when the military burden also goes up, and this difference is statistically significant.[16]

Regression analysis

The above analysis only considers the direct relationship between two variables in isolation: military and health spending. It is often the case that other variables hide or distort the relationship between the variables of interest. Using multiple regression analysis, it is possible to test for this by taking into account other potential influencing variables ('control variables'). For a regression analysis of the health and military spending data, the following control variables were chosen: (*a*) GDP per capita, on the basis that wealthier countries are likely to have a higher tax base, and thus to be more able to devote larger shares of GDP to public expenditure in general; (*b*) public debt service as a share of GDP, on the basis that high levels of debt service will restrict a government's ability to finance all spending areas; (*c*) a time trend, to take account of the fact that health expenditure has generally been rising as a share of GDP, while military expenditure has been falling—by accounting for this trend, the effects of deviations from the average trend are measured; and (*d*) the previous year's public sector balance, on the grounds that a high deficit one year is likely to lead to spending cuts the next year, and vice versa.

The resulting model is able to discern the effect of the military burden on the health share of GDP after accounting for the possible influence of these other variables. Two versions of the model were analysed: one looking at the effect on health spending of the same year's military spending, and the other looking at the effect of the previous year's military spending, to allow for the fact that there could be two-way interactions between the variables in the same year.

The results showed a significant positive relationship between the share of health expenditure in GDP and the share of military expenditure in GDP, whether the latter was measured in the same year or the previous year (with

[15] The correlation coefficient is +0.24. The statistical relationship between 2 variables is said to be statistically significant if it would be very unlikely—usually less than a 5% probability—for such a relationship to occur purely by chance. In this example there was a 5–10% probability that the result could have occurred by chance, thus it is on the borderline of being significant.

[16] The test used was a Chi-squared test with 2 degrees of freedom, giving a test statistic of $\chi^2(2) = 9.2$, $p = 0.01$ (a 1% probability of the result occurring by chance).

the result stronger when the previous year's military burden was used).[17] On average, a 1 percentage-point increase in the military burden in the previous year was associated with a 0.31 percentage-point increase in the health expenditure share of GDP in the current year.

Of the other variables, there at first appeared to be, as expected, a positive relationship between GDP per capita and the share of GDP spent on health, but this relationship became insignificant once a time trend was included; that is, there was a general tendency for the health share of GDP to increase over time regardless of the rate of growth in GDP per capita. The effect of debt service was not significant.

Somewhat surprisingly, a high budget balance (surplus) in the previous year was associated with a lower, not higher, share of GDP being spent on health in the current year. This is hard to interpret, but a conceivable explanation could be that health expenditure was used as a counter-cyclical measure—that is, it was increased in times of recession to stimulate the economy rather than being cut to deal with budget deficits. However, the main relationship of interest—that between military and health expenditure—remained the same whether or not this variable was included.

The findings of the regression analysis therefore back up the results of the simpler statistical tests: while the general trend for the region has been falling military burdens and rising health expenditure as shares of GDP, other things being equal, higher or increasing military burdens have been more likely to be associated with higher health expenditure shares than would otherwise be expected. This contrasts with the finding of a negative relationship between military and social expenditure in some of the studies looking at periods when many countries in the region were under military dictatorships.[18]

The reasons for this apparent positive connection are not apparent from the analysis conducted so far. One possible reason is that, following transitions to democracy, governments have found it politically easier to raise military spending if they are also raising health expenditure. Another possibility is that both military and health spending are influenced by other factors affecting the overall share of the government budget in GDP, that have not been considered as control variables. This question could be the subject of further research.

The results of these analyses must be treated with some caution. In particular, it should not be concluded that there is a causal relationship between increasing military spending and higher health spending—both are matters of deliberate policy choice. What is clear is that the findings of the current study offer no evidence of a tendency for military spending to crowd out health expenditure in Latin America—increases in the military burden have thus generally been funded either by increases in taxation or borrowing or by savings in other areas of government spending.

One theoretical shortcoming of both this study and the earlier studies cited above is that they do not contain an explicit model of government decision making that would explain how levels of military expenditure and

[17] Full regression results are available from the author on request. The model was an unbalanced panel data model with country-specific fixed effects.

[18] Apostolakis (note 13); Looney (note 13); and Scheetz (note 13).

other spending are co-determined. Ultimately, such studies may present empirical regularities—health and education spending tending to be higher or lower when military expenditure is higher or lower—but cannot explain them. Additionally, all such studies are non-generalizable, in the sense that budget decisions are policy choices specific to time and place, rather than some intrinsic property of these categories of spending. There is no reason to suppose that governments will follow the patterns of their predecessors or of the governments of other countries.

A fuller study would need to go beyond the data to look at how different areas of spending are matched to actual needs in the different areas, and at the decision-making processes behind government spending priorities. To properly assess whether military spending is excessive, it is necessary to address questions such as whether a clear link is made between national needs and priorities and actual spending levels; whether budgetary decision making is based on clear statements of policy (which are frequently lacking in the area of military expenditure); whether all sectors have equal ability to compete for scarce government resources; whether decision-making processes are open and inclusive, with scope for input from parliament and civil society; whether the processes and the resulting spending levels are transparent, so that spending levels can be meaningfully compared and assessed; and whether military spending, in particular, benefits from off-budget sources of funding that are not open to scrutiny or control.

The findings of the current study offer no evidence of a tendency for military spending to crowd out health expenditure in Latin America.

IV. Countries with high military spending in relation to health or education spending

While most Latin American countries devote considerably larger shares of GDP to health and education than to the military, two notable exceptions are Chile and Ecuador, which may be a matter of concern for citizens of those countries. This section considers possible reasons why these two are exceptions and whether there is a basis for such concerns.

Chile

Chile's level of health expenditure as a share of GDP has consistently been somewhere around the middle of the 21 countries considered. Chile has a mixed public–private health care system, introduced under the military dictatorship led by General Augusto Pinochet (1973–90) at the end of the 1970s, as part of a series of neoliberal reforms.[19] Health expenditure had risen sharply under the government of President Salvador Allende (1970–73), but was then heavily cut in the early years of the Pinochet regime, and changed little as a share of GDP until the restoration of democracy in 1990. A relatively low share of Chile's total health expenditure is government funded (less than half in almost all years, making it one of eight countries out of those

[19] Unger, J. et al., 'Chile's neoliberal health reform: an assessment and a critique', *PLoS Medicine*, vol. 5, no. 4 (Apr. 2008).

surveyed to have had higher private than government health expenditure in recent years). This has tended to keep government health expenditure, as a share of GDP, somewhat low for the region, especially considering that Chile is one of its wealthier countries.

Chile's level of public education expenditure as a share of GDP is relatively low for the countries surveyed, but not overwhelmingly so. As with health, there was considerable privatization of Chile's education system under the Pinochet regime. This has led to continued criticism of high levels of social segregation and funding inequality between public and private education.[20]

Chile's military burden, in contrast, is one of the highest in the region. One important caveat should be made to this statement: SIPRI's military expenditure figures for Chile include spending on the Carabineros, a gendarmerie force with a military structure and training that was, until 2011, part of the Ministry of Defence, but whose tasks are overwhelmingly related to civil law enforcement. The inclusion of such forces in military expenditure is debated. The Carabineros account for around a quarter of the SIPRI military expenditure figures for Chile, so if they were not counted, health expenditure would exceed military expenditure for most of the period under consideration. Nonetheless, Chile's military burden—and the ratio of military spending to health and education spending—would still be among the highest in the region.

Aside from the inclusion of the Carabineros, a number of other factors contribute to the relatively high SIPRI military expenditure figures for Chile. First, Chile's arms procurement is boosted by the 1958 Copper Law.[21] Under this law, 10 per cent of the revenue of the state copper company, Codelco, goes directly to the armed forces for arms and equipment purchases. Between 2005 and 2009, this source of funding represented an average of 21 per cent of the total SIPRI figure for Chile's military expenditure. Most countries in the region devote a far smaller share of their military expenditure to arms and equipment purchases. As a result of the Copper Law, Chile has over the past 20 years, and especially in the past five years, been the largest arms importer in the region by some margin, exceeding even the regional giant Brazil. A bill was passed to the Chilean Congress in 2011 to abolish the Copper Law and create a new, on-budget system for financing arms procurement.[22] The effect on spending levels remains to be seen.

Second, Chile has an extremely generous pension system for military personnel, as do many countries in the region. In 2009 military pension payments amounted to one-third of the total SIPRI figure for Chile.[23] Finally, constitutional law adopted shortly before General Pinochet left office

[20] E.g. Arango, A., 'The failings of Chile's education system: institutionalized inequality and a preference for the affluent', Council on Hemispheric Affairs, 30 July 2008, <http://www.coha.org/the-failings-of-chile's-education-system-institutionalized-inequality-and-a-preference-for-the-affluent/>; and 'Chile students stage mass protest for education', BBC News, 22 Sep. 2011, <http://www.bbc.co.uk/news/world-latin-america-15028214>.

[21] Ley Reservada del Cobre [Restricted Law on Copper], Law no. 13 196, adopted 29 Oct. 1958 (most recently modified in 1987), published in a restricted edition of the *Diario Oficial de la República de Chile*.

[22] Ebergenyi, I., 'Piñera submits bill to repeal financing military expenditure with copper exports', MercoPress, 20 May 2011.

[23] SIPRI deducts pension contributions paid by serving personnel from total military pension figures to avoid double-counting.

stipulates that the basic defence budget cannot fall below its 1989 level in real terms.[24]

Nonetheless, Chile's government health spending as a share of GDP has increased significantly in recent years, overtaking military spending in 2009.

Ecuador

Military and health spending in Ecuador followed very similar trends over the period under consideration, both generally falling as a share of GDP up to 2000, then rising significantly, with military expenditure reaching 3.4 per cent of GDP in 2009 and health expenditure reaching 2.9 per cent. Military spending was usually slightly higher, including for the most recent years studied, 2007–2009.[25] These trends came in the context of rapidly rising GDP, due in particular to high oil revenues, especially since 2003. In absolute terms, therefore, both have increased significantly in recent years; military spending by 241 per cent between 2000 and 2009.

Income from natural resources such as oil give the Ecuadorean Government a direct source of revenue without the need to impose taxes on the general population, thus enabling a general expansion of public expenditure, both relative to GDP and in absolute terms. SIPRI data suggests that high oil and natural resource revenues have contributed to large increases in military spending in recent years in a significant number of countries around the world.[26] Moreover, until 2008 the Ecuadorian military received funds from oil revenues, but it is unclear whether these funds were incorporated in the budget or were outside the official defence budget (and thus not included in SIPRI totals). However, the use of these funds was abandoned in 2008.[27] These increases in military spending gave Ecuador one of the highest military burdens in Latin America, despite the reduction in security threats since the final settlement of the country's border dispute with Peru in 1999.

One other factor leading to high military spending in Ecuador is, as with Chile, a high level of pension spending, equal to one-third of the total SIPRI figure in most recent years.

Ecuador is one of the poorest countries in South America, after Bolivia and Guyana. Thus, the country's economic base for public spending may be limited. It has consistently lagged behind most countries in South America in terms of government health expenditure as a share of GDP. Like Chile, in general less than half of spending on health comes from the state, although the share has increased in recent years. In 2007 Ecuador instituted a system of free health care for the first time, although poor levels of funding have

[24] Ley Orgánica Constitucional de las Fuerzas Armadas [Organic Constitutional Law of the Armed Forces], Law no. 19 948, adopted 22 Feb. 1989, *Diario Oficial de la República de Chile*, 27 Feb. 1990.

[25] Very little education spending data is available for Ecuador from UNESCO. Such figures as are available are very low, although Ministry of Education budgets show much higher levels. The source of this discrepancy is unclear. Ecuadorean Ministry of Finance, 'Gestión presupuestaria' [Budget management], <http://bi.finanzas.gob.ec/>.

[26] See e.g. Perlo-Freeman, S., Ismail, O. and Solmirano, C., 'Military expenditure', *SIPRI Yearbook 2010: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2010).

[27] Officers from the Ecuadorean Ministry of Defence, Private communication with the author, Sep. 2011.

caused severe difficulties and President Rafael Correa declared a state of emergency in the health system in 2011.[28] Thus, while there have been substantial increases in health spending in recent years, the health sector is having to deal with the effects of decades of underfunding and the challenges of newly established free universal coverage. In such circumstances, it seems reasonable to question the need for military spending to rise at the same pace as health spending in the absence of obvious security needs.

Comparison

Chile and Ecuador stand out as exceptions to the general regional picture of health and education spending far exceeding military spending. While these two countries are in many ways contrasting cases—one being among the richest countries in South America and the other among the poorest—they share two features that have helped to keep military spending high: generous military pension provisions and the channelling of natural resource revenues to military spending. In Chile, this has been entirely by off-budget means (although spending data is available), and not open to contestation by other areas of spending; in Ecuador, oil revenues have contributed to military spending at least partly through on-budget means, but also possibly by off-budget means. Both countries have also suffered from relatively low levels of publicly funded health and education provision, which in the case of Chile is in part a legacy of the Pinochet era.

However, health expenditure as a share of GDP is rising strongly in both countries; indeed in Chile, health spending overtook military spending for the first time in 2009. On the military side, Ecuador has ceased the practice of transferring oil funds directly to the military, while Chile is seeking to abolish the Copper Law. Thus, moves are being made in both countries to improve the transparency and rationality of military spending decision processes. Nonetheless, the high ratio of military to social expenditure remains and is likely to take some time to reverse, if it ever is reversed.

V. Conclusions

Subject to the limitations of the available data, this study does not find any support for the idea that increases in the military burden in Latin America have come at the expense of health or education expenditure since 1995.

On the contrary, the clear regional trend over the period studied, 1995–2009, was for health expenditure to increase while the military burden tended to fall. There was also something of an increasing trend in public education expenditure from 1998, but this was more muted. Moreover, the great majority of governments in the region spent considerably more on both health and education than on the military throughout the period.

The declining trend in the military burden more or less levelled off from 2003, falling in some countries and rising in a similar number of countries; the regional average military burden actually rose, but this was mainly due to rapid economic growth in Brazil. This did not stop the general rising trend

[28] Alvaro, M. 'Ecuador bolsters strained health care system', *Wall Street Journal*, 13 Jan. 2011.

in health expenditure, with most countries continuing to increase their health spending as a share of GDP.

Across countries, there is no evidence of a relationship one way or the other between military, health and education expenditure; that is, there is no tendency for countries with a high military burden to be more likely to have a relatively low share of health or education expenditure in GDP, or vice versa; the region includes all possible combinations of high or low military burden with high or low health or education spending.

The results suggest that, over time, higher levels of military spending and health spending (as a share of GDP) tend to go together, other things being equal. While not conclusive, there is at least no evidence for the opposite relationship: that one crowds out the other.

A possible interpretation of the results is that, in general, governments in the region have been at least implicitly responsive to a public desire for higher social expenditure. However, such a conclusion would require a closer analysis of government budgetary decision-making processes.

Gaps in transparency inevitably raise concern that resources may not be used in a manner related to actual military and social needs and in accordance with the popular will.

While there is no evidence that, in general, higher military spending directly leads to lower health or education spending, it remains the case that all government spending carries an opportunity cost, and that money spent in one area is money that is not spent in another or returned to the taxpayer. Thus, it could still be argued that high levels of military expenditure prevent even higher levels of social expenditure in some countries, with Chile and Ecuador exhibiting unusually high ratios, for the region, of military to social expenditure.

Limitations to transparency in military spending remain a problem in several Latin American countries, in some cases making it difficult to ascertain the true extent of military spending, which may be larger than the main defence budget.[29] Peru has a law providing for gas revenues to be used for military purposes; unlike Chile's copper revenues, the figures for these gas revenues, and how much of them are spent on the military, are not always available. In Venezuela, it is thought that oil revenues and credit payments may be used for off-budget arms purchases.[30] Meanwhile, Cuba's military spending is highly opaque, with only an aggregated total available for a few years of the period.

While in these countries it is still likely to be the case that health and education spending are considerably higher than military spending, such gaps in transparency inevitably raise concern that resources may not be used in a manner related to actual military and social needs and in accordance with the popular will. Improving transparency and accountability in military spending processes would be an important measure towards ensuring the proper allocation of resources.

[29] Bromley and Solmirano (note 4).
[30] Bromley and Solmirano (note 4).

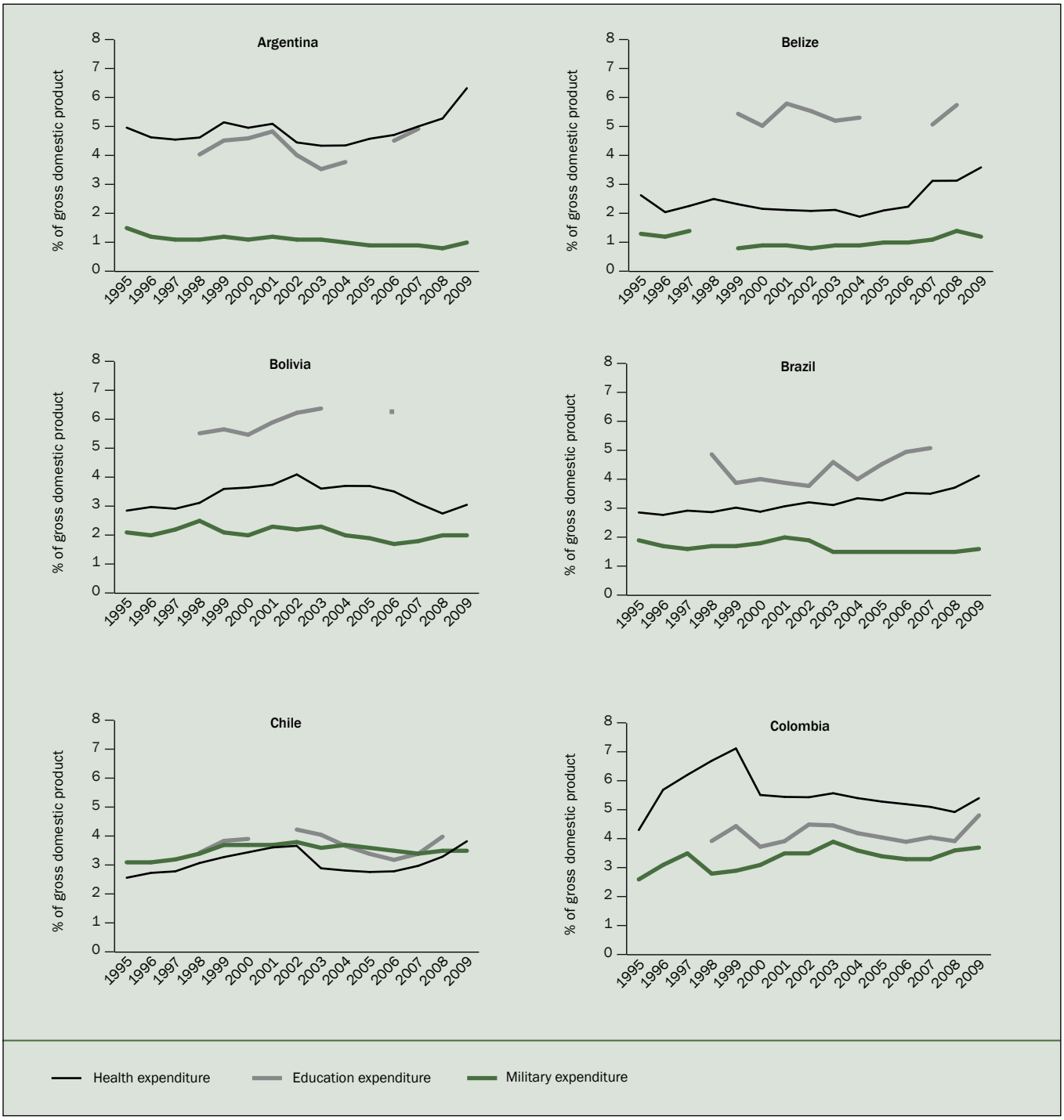


Figure 4. Military, health and education spending as shares of gross domestic product in 21 Latin American countries, 1995–2009

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; and World Bank World Development Indicators online, <http://data.worldbank.org>.

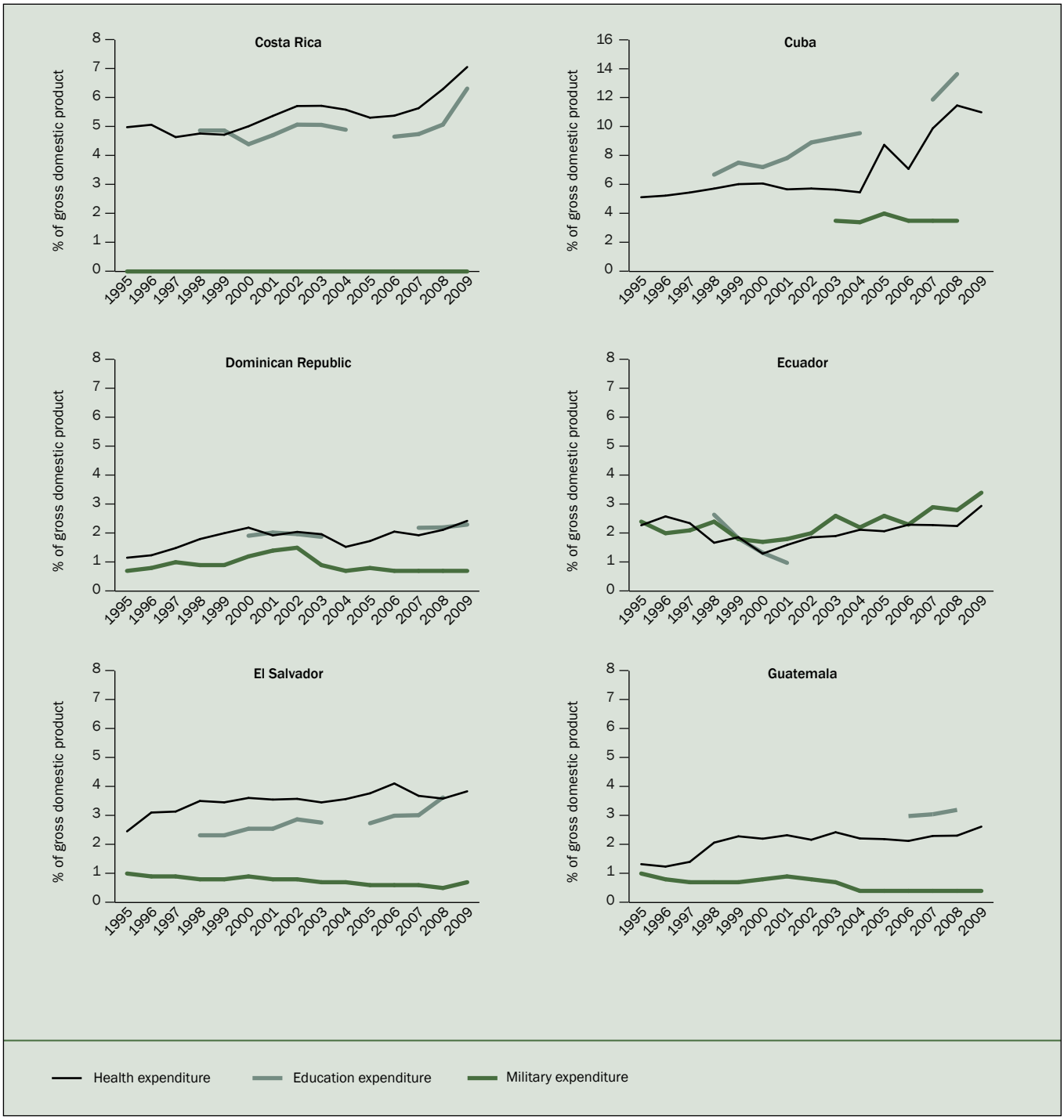
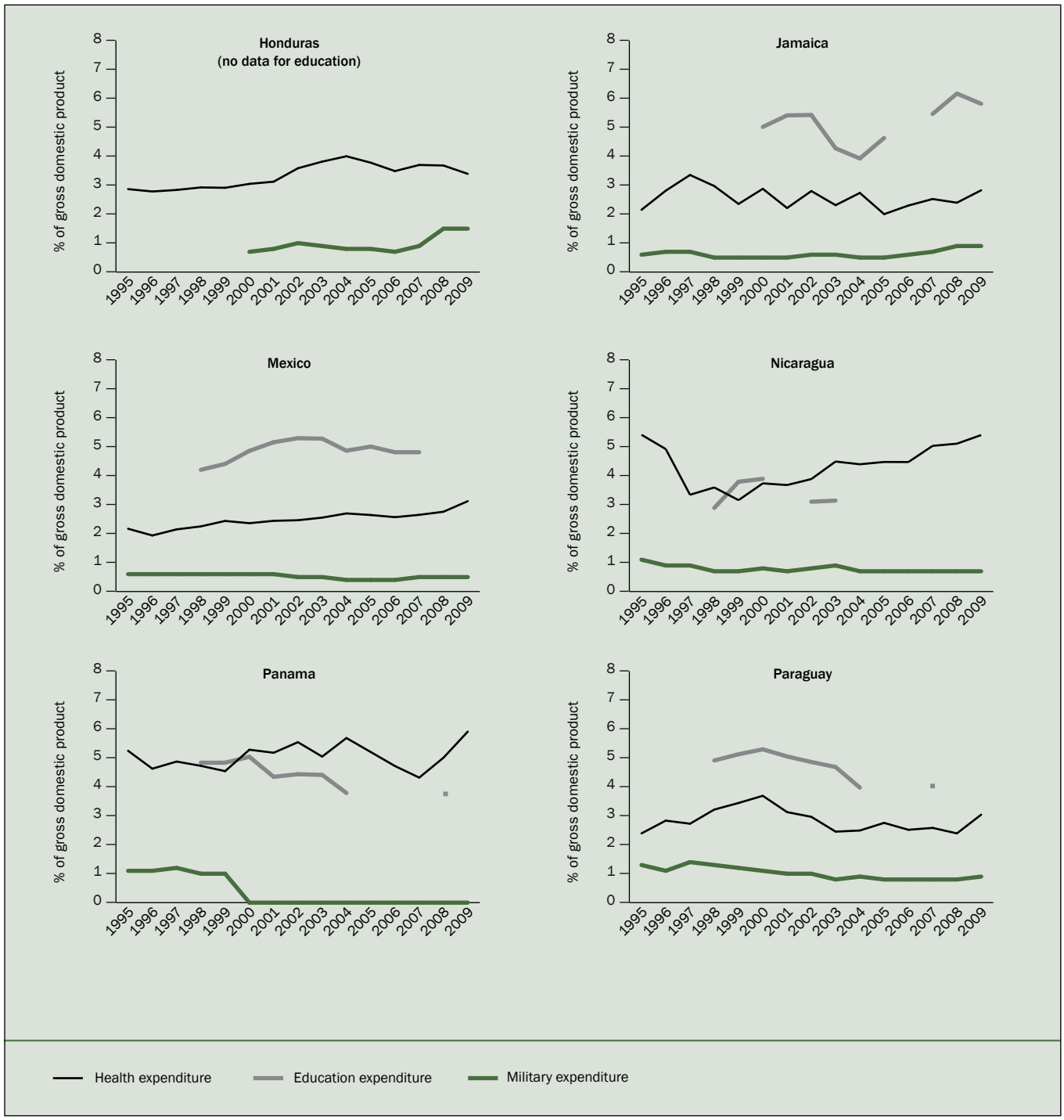


Figure 4 *continued*



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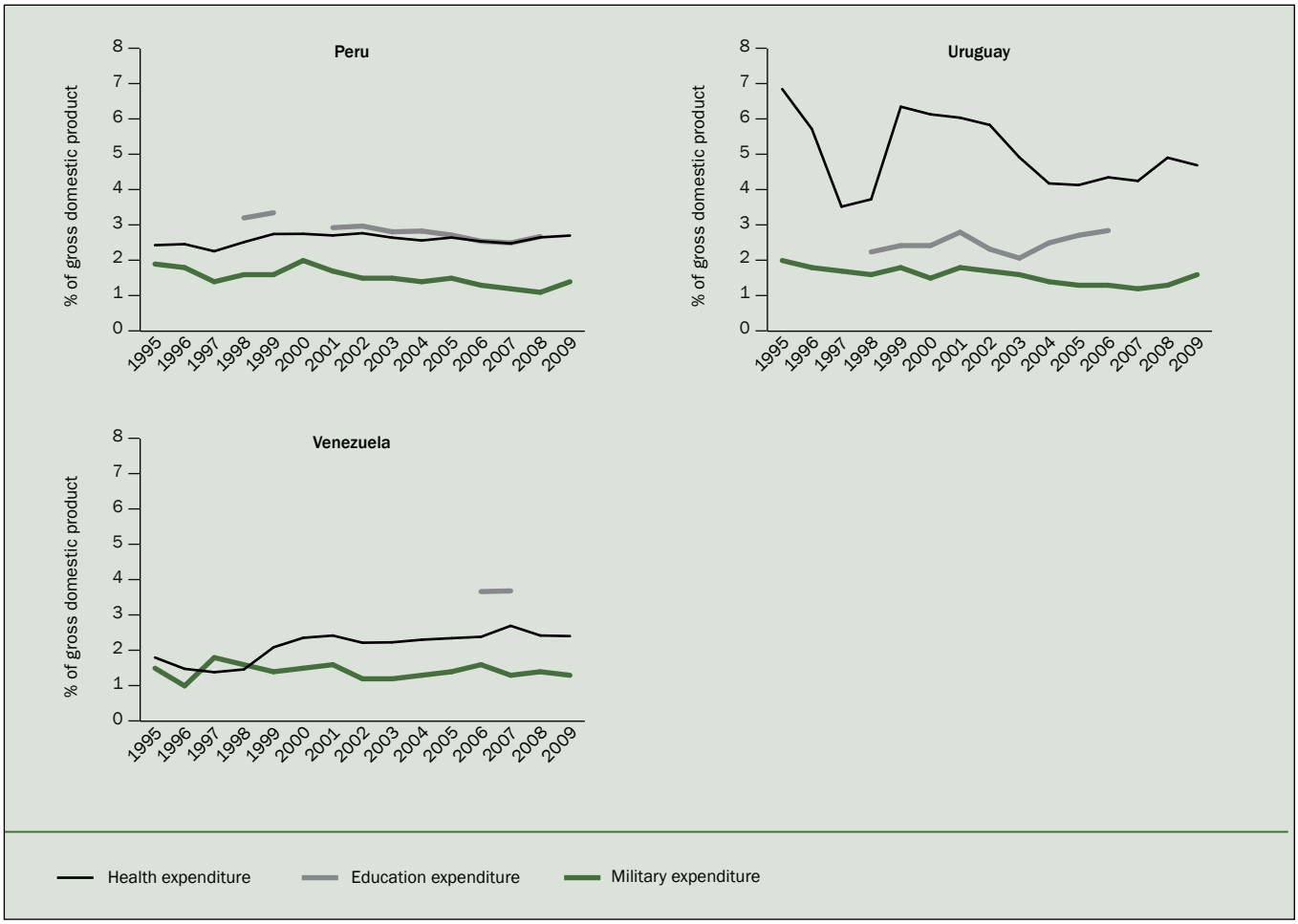

Figure 4 *continued*

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BUDGETARY PRIORITIES IN LATIN AMERICA: MILITARY, HEALTH AND EDUCATION SPENDING

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CONTENTS

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